

Kenichiroh HASHIMOTO, S.N. 10/549,788
Page 3

Dkt. 2271/75146

Listing of Claims

The following listing of claims will replace all prior versions, and listings, of claims in the subject application:

1. (currently amended) A liquid ejection head, comprising:
an ejection port for ejecting a liquid;
a flow passage communicating with said ejection port;
a device substrate provided with a heating body for forming a bubble in said liquid filled in said flow passage; and

a movable member provided on said device substrate in a state such that a first end thereof is fixed upon said device substrate and a free end at an opposite end of said movable member is in a freely movable state, said movable member being provided so as to face said heating body such that there is formed a gap between said movable member and said device substrate, said movable member causing a displacement upon ejection of said liquid from said ejection port as a result of a pressure caused by formation of said bubble,

wherein said movable member is constructed by lamination of three or more layers, an end surface of at least one layer of said movable member being covered, at said free end, by another layer of said three or more layers.

2. (currently amended) The liquid ejection head as claimed in claim 1, wherein said end surface of said movable member at said free end forms a flat surface.

3. (original) The liquid ejection head as claimed in claim 1, wherein said movable

Kenichiroh HASHIMOTO, S.N. 10/549,788
Page 4

Dkt. 2271/75146

member has an initial bending in a direction opposite to said heating body.

4. (currently amended) A liquid ejection head, comprising:

an ejection port for ejecting a liquid;

a flow passage communicating with said ejection port;

a device substrate provided with a heating body for forming a bubble in said liquid filled in said flow passage; and

a movable member provided on said device substrate in a state such that a first end thereof is fixed upon said device substrate and a free end at an opposite end of said movable member is in a freely movable state, said movable member being provided so as to face said heating body such that there is formed a gap between said movable member and said device substrate, said movable member causing a displacement upon ejection of said liquid from said ejection port as a result of a pressure caused by formation of said bubble,

said movable member comprising lamination of at least three layers of two, different materials, an end surface of at least one layer of said movable member being covered, at said free end, by a layer forming an outermost layer of said movable member.

5. (currently amended) The liquid ejection head as claimed in claim 4, wherein said end surface of said movable member at said free end forms a flat surface.

6. (original) The liquid ejection head as claimed in claim 4, wherein said movable member has an initial bending in a direction opposite to said heating body.

Kenichiroh HASHIMOTO, S.N. 10/549,788
Page 5

Dkt. 2271/75146

7. (currently amended) A liquid ejection head, comprising:

an ejection port for ejecting a liquid;

a flow passage communicating with said ejection port;

a device substrate provided with a heating body for forming a bubble in said liquid filled in said flow passage; and

a movable member provided on said device substrate in a state such that a first end thereof is fixed upon said device substrate and a free end at an opposite end of said movable member is in a freely movable state, said movable member being provided so as to face said heating body such that there is formed a gap between said movable member and said device substrate, said movable member causing a displacement upon ejection of said liquid from said ejection port as a result of a pressure caused by formation of said bubble,

said movable member comprising lamination of two or more layers of two, different materials, said lamination including a first layer closest to said device substrate, an [[edge]] end surface of said movable member being covered, at said free end, by a layer of an odd number order as counted from said first layer.

8. (currently amended) The liquid ejection head as claimed in claim 7, wherein said [[edge]] end surface of said movable member at said free end forms a flat surface.

9. (original) The liquid ejection head as claimed in claim 7, wherein said movable member has an initial bending in a direction opposite to said heating body.

10. (currently amended) A liquid ejection head, comprising:

Kenichiroh HASHIMOTO, S.N. 10/549,788
Page 6

Dkt. 2271/75146

an ejection port for ejecting a liquid;

a flow passage communicating with said ejection port;

a device substrate provided with a heating body for forming a bubble in said liquid filled in said flow passage; and

a movable member provided on said device substrate in a state such that a first end thereof is fixed upon said device substrate and a free end at an opposite end of said movable member is in a freely movable state, said movable member being provided so as to face said heating body such that there is formed a gap between said movable member and said device substrate, said movable member causing a displacement upon ejection of said liquid from said ejection port as a result of a pressure caused by formation of said bubble,

said movable member comprising lamination of three or more layers of three, different materials, an edge surface of said movable member being covered, at said free end, said lamination including a first layer closest to said device substrate, an edge surface of said movable member being covered by an uppermost layer forming ~~[[aid]]~~ said lamination and formed of a material identical with a material constituting said first layer.

11. (original) The liquid ejection head as claimed in any of claim 10, wherein said edge surface of said movable member at said free end forms a flat surface.

12. (original) The liquid ejection head as claimed in claim 10, wherein said movable member has an initial bending in a direction opposite to said heating body.

13. (currently amended) A liquid ejection head, comprising:

Kenichiroh HASHIMOTO, S.N. 10/549,788
Page 7

Dkt. 2271/75146

an ejection port for ejecting a liquid;

a flow passage communicating with said ejection port;

a device substrate provided with a heating body for forming a bubble in said liquid filled in said flow passage; and

a movable member provided on said device substrate in a state such that a first end thereof is fixed upon said device substrate and a free end at an opposite end of said movable member is in a freely movable state, said movable member being provided so as to face said heating body such that there is formed a gap between said movable member and said device substrate, said movable member causing a displacement upon ejection of said liquid from said ejection port as a result of a pressure caused by formation of said bubble,

said movable member comprising lamination of two or more layers of two or more materials, said movable member having a flat ~~[[edge]]~~ end surface at said free end.

14. (original) The liquid ejection head as claimed in claim 13, wherein said movable member has an initial bending in a direction opposite to said heating body.

15. (original) A liquid ejection head, comprising:

an ejection port for ejecting a liquid;

a flow passage communicating with said ejection port;

a device substrate provided with a heating body for forming a bubble in said liquid filled in said flow passage; and

a movable member provided on said device substrate in a state such that a first end thereof is fixed upon said device substrate and a free end at an opposite end of said movable

Kenichiroh HASHIMOTO, S.N. 10/549,788
Page 8

Dkt. 2271/75146

member is in a freely movable state, said movable member being provided so as to face said heating body such that there is formed a gap between said movable member and said device substrate, said movable member causing a displacement upon ejection of said liquid from said ejection port as a result of a pressure caused by formation of said bubble,

said movable member having an initial bending in a direction opposite to said heating body.

16. (original) The liquid ejection head as claimed in claim 15, wherein said movable member engages with a stopper part provided at a side opposite to said heating body in an initial state of said movable member.

17. (original) The liquid ejection head as claimed in claim 15, wherein said movable member carries a tensile film at a side thereof opposite to a side of said heating body.

18. (currently amended) A liquid cartridge comprising a liquid ejection head and a liquid container containing a liquid to be supplied to said liquid ejection head, said liquid container forming a unitary body with said liquid ejection head, said liquid ejection head, comprising:

an ejection port for ejecting a liquid;

a flow passage communicating with said ejection port;

a device substrate provided with a heating body for forming a bubble in said liquid filled in said flow passage; and

a movable member provided on said device substrate in a state such that a first end

Kenichiroh HASHIMOTO, S.N. 10/549,788

Dkt. 2271/75146

Page 9

thereof is fixed upon said device substrate and a free end at an opposite end of said movable member is in a freely movable state, said movable member being provided so as to face said heating body such that there is formed a gap between said movable member and said device substrate, said movable member causing a displacement upon ejection of said liquid from said ejection port as a result of a pressure caused by formation of said bubble,

wherein said movable member is constructed by lamination of three or more layers, an end surface of at least one layer of said movable member being covered, at said free end, by another layer of said three or more layers.

19. (currently amended) The liquid ejection apparatus for ejecting a liquid from a liquid ejection head, said liquid ejection apparatus comprising a liquid ejection head comprising:

an ejection port for ejecting a liquid;

a flow passage communicating with said ejection port;

a device substrate provided with a heating body for forming a bubble in said liquid filled in said flow passage; and

a movable member provided on said device substrate in a state such that a first end thereof is fixed upon said device substrate and a free end at an opposite end of said movable member is in a freely movable state, said movable member being provided so as to face said heating body such that there is formed a gap between said movable member and said device substrate, said movable member causing a displacement upon ejection of said liquid from said ejection port as a result of a pressure caused by formation of said bubble,

wherein said movable member is constructed by lamination of three or more layers, an end surface of at least one layer of said movable member being covered, at said free

Kenichiroh HASHIMOTO, S.N. 10/549,788
Page 10

Dkt. 2271/75146

end, by another layer of said three or more layers.

20. (currently amended) An image forming apparatus for forming an image on a recording medium by ejecting a liquid from a liquid ejection head, said image forming apparatus comprising any of a liquid ejection head comprising:

an ejection port for ejecting a liquid;

a flow passage communicating with said ejection port;

a device substrate provided with a heating body for forming a bubble in said liquid filled in said flow passage; and

a movable member provided on said device substrate in a state such that a first end thereof is fixed upon said device substrate and a free end at an opposite end of said movable member is in a freely movable state, said movable member being provided so as to face said heating body such that there is formed a gap between said movable member and said device substrate, said movable member causing a displacement upon ejection of said liquid from said ejection port as a result of a pressure caused by formation of said bubble,

wherein said movable member is constructed by lamination of three or more layers, an [[edge]] end surface of at least one layer of said movable member being covered, at said free end, by another layer of said three or more layers.

21. (currently amended) A method of manufacturing a liquid ejection head, said liquid ejection head comprising: an ejection port for ejecting a liquid; a flow passage communicating with said ejection port; a device substrate provided with a heating body for forming a bubble in said liquid filled in said flow passage; and a movable member provided on said device substrate

Kenichiroh HASHIMOTO, S.N. 10/549,788
Page 11

Dkt. 2271/75146

in a state such that a first end thereof is fixed upon said device substrate and a free end at an opposite end of said movable member is in a freely movable state, said movable member being provided so as to face said heating body such that there is formed a gap between said movable member and said device substrate, said movable member causing a displacement upon ejection of said liquid from said ejection port as a result of a pressure caused by formation of said bubble, wherein said movable member is constructed by lamination of three or more layers, an edge end surface of at least one layer of said movable member being covered, at said free end, by another layer of said three or more layers,

said method comprising the steps of forming a part in which two or more layers of a same material are directly laminated; and

etching said part.